TIMBER HARVESTING PRACTICES
FOR
FORESTRY OPERATIONS IN MANITOBA

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Manitoba Natural Resources
Forestry Branch

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HARVESTING PRACTICES YOR SUSTMNABLE DEVELOPMENT

In 1989 Manitoba Natural Resources, Forestry Branch: initiated its sustainable development strategy for forests. The Forest Strategy was developed as a component of Manitoba's Land and Water Strategy for sustainable development. Forty policies were produced to ensure that all forest related activities were conducted in an environmentally and economically sustainable manner.

These harvesting guidelines are one component of Manitoba's sustainable development strategy I for forests. *Harvesting Practices for Forestry Operations in Manitoba* support Forest Strategy Policy 1. 1 under the Environmental Protection section which states:

> *Incentives, programs and (as required) guidelines or regulations shall be established, implemented and monitored to ensure that forest access, harvesting, renewal and all use, activities maintain the environmental ,integrity of the forest ecosystem.*

Harvesting Practices for Forestry Operations in Manitoba addresses issues relating to forest access, harvesting and renewal by outlining , appropriate forestry methods for minimizing environmental impacts. By adhering to the guidelines forest users can be assured that they are working within the principles of sustainable forest development.

INTRODUCTION

In accordance with the authority granted under section 41 of *The Forest Act* the following timber harvesting guidelines have been developed by the Forestry Branch and will be applied to all forest harvesting activities occurring on crown lands within the province of Manitoba. These harvesting guidelines outline acceptable operating practices and standards that are expected to be met during harvest operations on timber sale agreements, licenses and permits.

The harvesting guidelines are intended to provide direction to forest operators as they carry out their day to day harvesting activities. The guidelines have also been developed to assist Departmental staff in the field application of sound resource management principles and operating requirements that are outlined in a number of legislated acts, regulations and provincial policies.

The timber harvesting guidelines interpret how operations should be carried out to conform to relevant acts. However, the guidelines are not a substitute for existing acts and regulations governing activities on crown lands and are not to be used in isolation of existing guidelines e.g. *Forest Management Guidelines for Wildlife in Manitoba, Recommended fish protection measures for Stream Crossings in Manitoba.*

Guidelines do not have direct legislative authority; regulatory or enforcement action must be based on and refer to legislated statutes and regulatory requirements upon which the guidelines have been developed. However, licenses, permits and timber sale agreements can require operators to comply with guidelines and failure to do so can result in suspension of the operation. Further, if the operator's failure to comply with the guidelines also violates *The Forest Act* or any other act, the operator may be charged under that act.

These guidelines are not intended to interpret all aspects of *The Forest Act.* They specifically address operating practices and related concerns. It is recognized that from time to time forest operations may experience exceptional circumstances or unusual operating conditions which could make it difficult for operators to adhere to the harvesting guidelines. In such cases, Manitoba Natural Resources staff, responsible for timber supervision and enforcement have the authority to waive or modify guideline requirements provided that these changes do not unduly compromise the conditions of approval outlined in approved plans, operating permits, work permits and/or timber sale agreements. All amendments or adjustments must be communicated in writing to the license holder and duly noted on the appropriate work permits.

The timber harvesting guidelines are subject to periodic review and will be revised as required.

CUTTING PRACTICES

Generally, for softwood stands, the applied method of harvest is the patch cut or clear cut, whereby all merchantable timber is removed from within the approved cut-block boundary (see cut-block design). However this does not preclude the use of selective or other methods of harvesting.

In the case of mixed wood stands where the desired species is the softwood component the hardwoods deserve special consideration during harvest operations. When hardwood trees are felled to facilitate the removal of the intermixed soft woods the post harvest rate of hardwood suckering increases and on fresh or moist sites grasses are quick to invade the open areas of the stand. The hardwood suckering and grasses compete for the available growing space aggressively seeking out the available moisture and nutrients making it difficult to re-establish the softwoods on the site. In addition, the felled hardwood trees become significant obstacles to tree planters and site preparation equipment which may be needed to prepare the ground in advance of planting.

When mixed wood stands are being harvested and the hardwood component is not being utilized a reasonable effort must be made to leave the hardwood component undisturbed. Consideration should be given to forgo the harvesting of softwoods when it is likely that a large percentage of intermixed hardwood stems will be felled and left utilized in the process. When in the coarse of operations a hardwood stem is felled and left unutilized it would be good practice to buck up the stems so they will not unduly impede subsequent renewal activities.

The felling of timber should be carried out so as not to damage the timber standing along the cut-block boundaries or within designated buffers.

Care should also be taken to avoid damaging or disturbing unmerchantable, live residual trees located within the cut-block.

Damage to concentrations of young coniferous growth should be minimized by careful location of roads, skid trails and landings. Where large concentrations of young coniferous growth occurs in the under-story the area should be protected from harvesting equipment by a ribboned boundary or appropriate cutting practices should be employed (i.e. merchantable trees within areas of young growth should be left undisturbed if the merchantable volume is negligible and/or excessive damage to the young growth will occur.)

Reforested areas shall be left undisturbed with no travel or construction of trails, landings etc. within the boundary of the treated area. Approval is required to use any existing, identifiable trails within reforested areas.

The general rule of thumb is to harvest the oldest stands first. However, harvesting priority should also be given to those stands or portions of stands, which are at greatest risk to natural destructive agents such as wind, disease, insects or fire.

At the conclusion of the harvesting season or when cutting is completed in a particular area the comers and ragged edges of the cutting face should be rounded and shaped to minimize the effect of wind on the exposed stand edge.

PROGRESSIVE OPERATIONS/CLEAN-UP

To minimize waste and poor utilization of timber resources a well planned harvest operation is essential. Good operating practices include the use of well planned skid trails, roads and landings. To encourage high levels of utilization the following harvesting guidelines apply:

A) cut-blocks must be harvested in a progressive manner and in accordance with the approved operating plan and permit conditions;

B) operators must undertake clean-up work concurrent with harvest operations (same day). This includes:

- the felling and skidding of all merchantable timber (see utilization standards) within the approved cut-block boundary;
- to minimize breakage; the daily collection and piling of stray merchantable pieces scattered about skidways and landings.

To ensure that operations are progressive, operators are required to obtain a final cutblock inspection from Departmental Staff immediately prior to relocating operations from one cut-block or operating area to another.

DEBRIS DISPOSAL

All logging debris, including the debris resulting from landing, block road and skid trail development, is to be contained within the cut-block boundaries.

No slash is to be pushed into standing timber or otherwise distributed outside of cut-block boundaries.

Logging debris shall be lopped and scattered within the block so as to lie close to the ground.

Accumulations of tops and slash at landings and spoil banks from landing and road construction are to be maintained in compacted piles. This debris is to be disposed of in a manner as determined by Manitoba Natural Resources.

Chipper debris from field chipping operations is to be disposed off in a manner approved by Manitoba Natural Resources.

Topping and limbing must occur at the stump and any deviation requires approval from Manitoba Natural Resources.

UTILIZATION STANDARDS

The following timber utilization standards shall apply to all harvest operations unless otherwise specified by the Department. ("dbh" = diameter at breast height = diameter measured at a point 1.5 metres (m) from the ground; "stump height" is the lowest point of tree utilization, not to exceed 30.0 centimetres (cm) above ground level.)

- A merchantable coniferous tree is defined as one which measures 11. 0 cm diameter or greater at dbh and a merchantable length of 2.4 m or greater from stump height to a 7.6 cm top diameter.

- A merchantable deciduous tree is defined as one which measures 11.0 cm diameter or greater at dbh and a merchantable length of 2.4 in or greater from stump height to a 10.2 cm top diameter.

- A merchantable log or broken piece is any which contains a minimum of:

    - 50% sound wood, and
    - 2.4 m length to a 7.6 cm small end for coniferous, or
    - 2.4 m length to a 10.2 cm small end for deciduous.

- Trees are to be cut such that the stump height does not exceed 30 cm above adjacent ground level.

All down, broken or defective trees found on logged areas whose merchantable content comprises 50% or more of the whole, and whose dimensions meet or exceed the minimum merchantable piece size specifications above shall be utilized.

The practice of butting felled trees in order to remove butt rot is only permitted when the rot exceeds 50% of the tree butt area. Butting is only allowed in 60 cm increments until the butt rot has been reduced to 50% of the cross sectional area of the tree butt.

All harvested timber shall be removed within one year of the expiration date noted on the permit (timber permit, work permit, general operating permit) granting the operator authority to harvest the timber.

CUT-BLOCK DESIGN

The design and configuration of cut-blocks across an operating area must take into account many things such as site, stand type, logging system and renewal prescription and give due consideration to other resources and resource users.

Generally Cut-block boundaries should be located along natural wind firm boundaries (i.e. swamps, hardwood stands and over ridges). Site conditions should be as homogeneous as possible throughout the cut-block to facilitate harvesting and renewal logistics. Cut-block size will vary depending on site, species management guidelines and wildlife or other resource concerns. However, cut-blocks are generally expected to average less than 100 hectares. In areas where significant populations of moose and other ungulates are present, wildlife travel corridors and buffers should be incorporated to enhance the use of cut-overs by browsing ungulates. Visual barriers should be considered to minimize the negative effects that improved vehicle access has on wildlife populations (i.e. increased hunting pressure). For more detailed information or more specific species management guidelines please refer to the document Forest *Management Guidelines for Wildlife in Manitoba.*

In the design of cut-blocks and location of roads, consideration should also be given to the effects of harvesting operations on water quality. Similar to the forest management guidelines for wildlife, the Fisheries Branch has prepared guidelines that outline acceptable procedures for crossing streams and protecting fish habitat in Manitoba's lakes and streams. Please refer to these documents for specific information.

BUFFERS AND BUFFER MANAGEMENT

Strips of timber and/or vegetation left undisturbed to buffer or manage the effects of harvest operations on wildlife, quality and quantity of water, and aesthetics is a common practice in harvest planning. It is important however that in the establishment of buffers, due consideration be given to the intended function of the buffer. Depending upon its purpose, the size or width of the buffer may vary. It is also important to enhance the longevity of the usefulness of a buffer. Buffers deteriorate as trees age and decay. Buffers in such condition are prone to insect infestations or fire which may move into and seriously damage young immature stands in adjacent cut-overs. Large trees in buffers protecting waterways are susceptible to wind-throw and may be uprooted. The exposed soils may lead to serious erosion and sedimentation problems. It would, therefore, be prudent to closely evaluate each buffer at the time of harvest to determine whether or not some of the larger or older trees could be harvested from the buffer without seriously compromising the integrity or effectiveness of the buffer.

Generally speaking and to guide harvest planners and operators the following points about buffers need to be taken into consideration. Where necessary and feasible, strips of residual timber (buffers) are to be left standing to:

a) serve as escape cover and travel corridors for wildlife populations in the area.

b) act as a visual barrier to aide in preventing the harassment of wildlife from roadways and trails located along side of cut-overs.

c) serve as a filter strip around lakes and streams to slow surface run-off from adjacent cut-overs thereby reducing the erosion hazard and water sedimentation.

Ideally a buffer should be safeguarded from accidental harvesting by placing ribbons along the length of its boundary prior to the commencement of harvest operations.

ROAD, TRAIL AND LANDING CONSTRUCTION

When planning and constructing roads, existing trails and cleared survey lines are to be used wherever possible.

Timing of construction should be such that fish and wildlife concerns will not be compromised.

Bared areas that result from road and landing construction should be kept to a minimum and rehabilitated as required.

Landings should be constructed in proportion to adjacent timber size and density. As a general rule of thumb landings, when needed, should be located to accommodate skidding distances of up to 200 metres. Every effort should be made to allow the continued re-use of landings (e.g. hot-logging). Where possible landing construction should be avoided and wood piled on the stump.

Well located skid trails are preferred over roads. Where roads are necessary they are to be located to minimize environmental impacts. Road locations should for example:

- avoid unstable areas, water source areas, springs and seepage, and sensitive wildlife areas.
- follow natural ridges and moderate slopes to minimize cuts and fills.
- excessive rutting of skid trails should be avoided.

Roads, trails and landings, unless approved otherwise, shall not be constructed within:

- 100 m of the high-water mark of any permanent watercourse,
- 30 m of any intermittent watercourse, or
- a water source area including seepage and springs.

Merchantable softwood and hardwood timber on road rights-of-way, trails and landings shall be harvested and piled prior to construction.

The debris which results from clearing roads, trails and landings shall be wind-rowed to one side of the clearing, compacted by heavy equipment, and lopped. Windrows should be 1 cat blade width from standing timber. Debris shall not be pushed or otherwise distributed into standing timber. In some cases it may be possible to bury debris under the road bed or in excavation pits or re-distribute the debris over the right of way. Such methods of disposal will require Departmental approval.

To act as a fire-break, and to allow for lateral drainage and wildlife movement, debris windrows should contain breaks of 6.0 metres minimum every 30.0 metres or, alternately, the windrow placement may be varied from side to side along the right-of-way.

WATERCOURSE CROSSINGS, DRAINAGE AND ROAD MAINTENANCE

Proper drainage shall be included in road construction to disperse water and minimize erosion on the road surface, cut and fill slopes, and in ditches.

All necessary safeguards shall be taken to prevent sedimentation into watercourses in all phases of road construction. The following points are presented as examples of such safeguards.

* Ditches shall not drain directly into watercourses.

* Long, continuous grades should be minimized to prevent the build up of run-off in drainage ditches; where long grades cannot be avoided, close spacing of culverts should be utilized to maximize cross-drainage.

* Soil or deleterious material shall not be deposited into or pushed through any watercourse, or onto the ice of any watercourse.

* Temporary winter crossings should be constructed with ice and snow. De-limbed logs may be used with ice and snow upon approval only.

* Temporary winter crossings shall be completely removed before spring break-up.

* All roads should be adequately and routinely maintained to prevent problems such as washouts, slumping, clogged or bent culverts, and erosion.

* Upon abandonment of a road:

    - all industrial waste and refuse is to be removed,
    - watercourses are to be restored to original condition, including stream bed.
    - all unstable fill material is to be removed, the banks restored to original contours and revegetated,

All stream crossings will conform to the Fisheries Branch *Recommended Fish Protection Procedures for Stream Crossings in Manitoba.*

CAMPSITES, WASTE DISPOSAL AND FUEL STORAGE

Camps should be located on well-drained, upland sites. and all merchantable timber shall be logged prior to clearing campsites and storage sites. Sites to be kept to a minimum size.

Material from site clearing shall be removed and piled in such a manner so it can be re-distributed over disturbed areas upon abandonment.

Unless otherwise approved by the Department, campsites, storage sites, and waste disposal pits shall be located no less than:

- 300 m from the high water mark of any permanent watercourse,
- 300 m or out of site of any numbered highway, whichever is greater,
- 100 m from other public roads, and
- 1 kilometre from identified mineral licks and other identified key wildlife areas.

Camps must have all sanitary and wastewater facilities constructed to standards set by regulation.

Domestic and industrial waste accumulating in temporary winter camps should be contained in a manner that will allow it to be removed to established waste disposal grounds or Departmentally approved disposal pits by seasons end.

Waste oil shall not be drained onto the ground or into watercourses. When servicing equipment, waste petroleum products and anti-freeze shall be drained into suitable containers and removed to an approved disposal ground or recycling facility.

Storage of petroleum and chemical products shall be located a minimum of 150 metres from the normal high water mark of any lake, river or stream.

At fuel storage sites, a compacted earth berm shall be constructed around the perimeter of tanks and be of sufficient height to contain the contents of the tanks *(Environment Act,* Regulation 97/88R). A secondary containment structure may be required for tanks storing 4,546 litres or more. Any spill of petroleum products is to be cleaned up immediately. Any spill of over 68.2 litres shall be reported immediately to the District Natural Resource Officer and Department of Environment.

Upon final completion of operations -all camps, buildings, industrial waste and materials (such as cables and, oil drums) and equipment shall be "removed, all pits filled, and the total site shaped to original contours. Departmental approval is, required prior to site abandonment.

FOREST FIRE PROTECTION

In compliance with *The Forest Act* Regulations and in accordance with all agreements, plans- and operating permits, pertaining to the operation, Fire fighting equipment shall be on site and in serviceable condition during active operating seasons.

It is a good -practice to maintain a slash-free firebreak zone -of 5-metre minimum width around, all cut-block perimeters and public roadways.